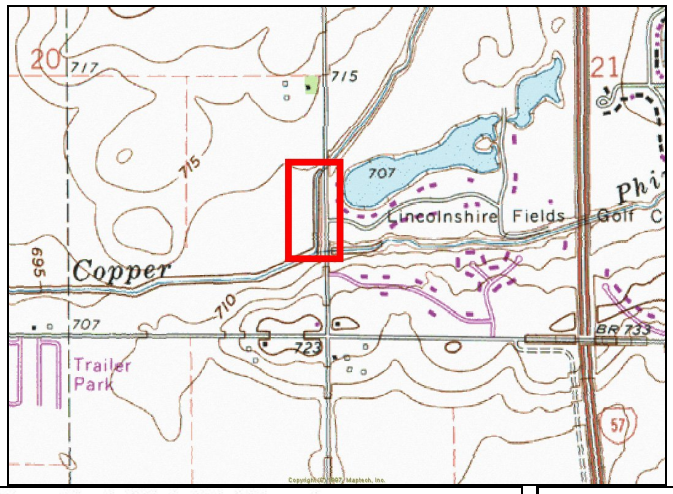
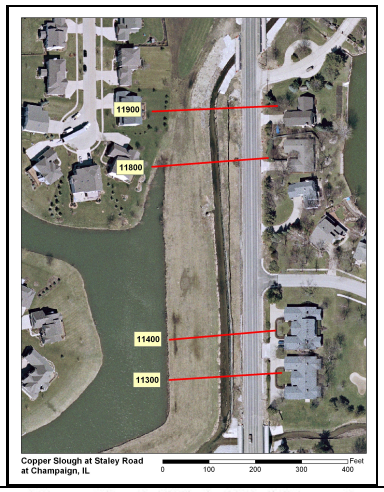
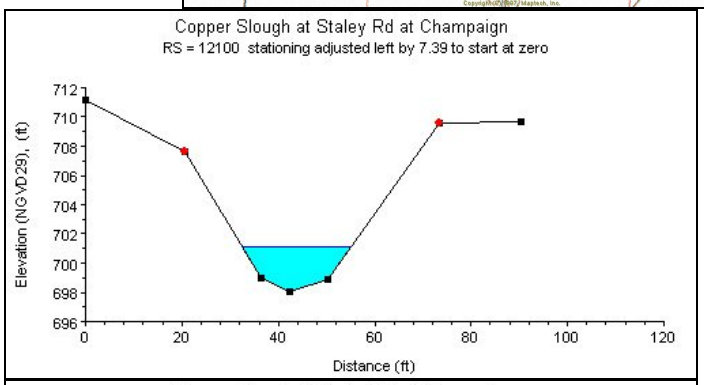
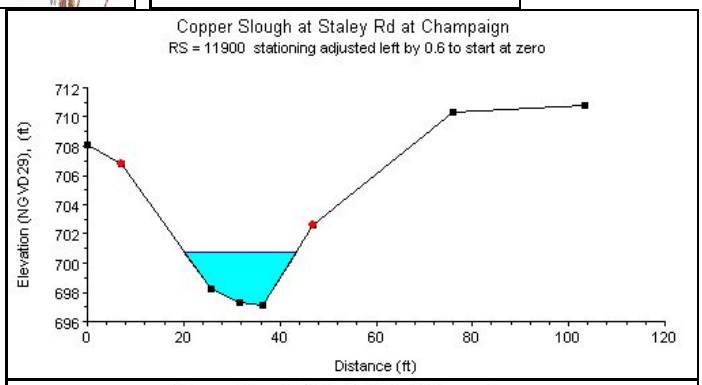
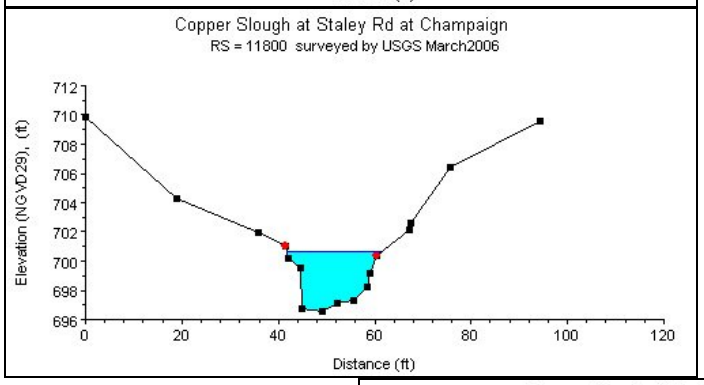
Copper Slough at Staley Road at Champaign, IL

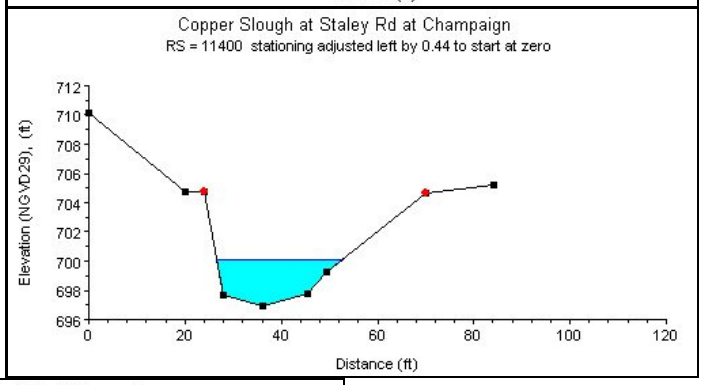


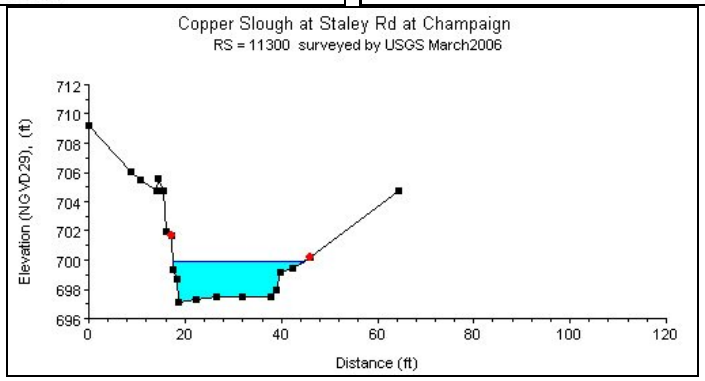












Study Reach.--The channel reach under consideration is a constructed channel in an urban setting, as shown on the quadrangle map at the top left. The study reach, about 750 ft. long, is located just downstream of the Staley Road bridge and upstream of the confluence with Phinney Branch. Four cross sections (surveyed by Clark-Dietz, Inc. in January 2005) are available for describing the channel geometries in the study reach. The channel alignment, approximate variations in channel width and bank conditions, and locations of cross sections are shown in the aerial photo on the top right. Because of the similarities in cross sectional geometries, cross sectional plots are river stations (RS) 11900, 11800, 11400, and 11300, as plotted above, are selected as representative cross sections.

Gage Location.--Lat 40°05'20.5"N, long 88°18'50.7"W (NAD of 1983), in SW1/4 NW1/4 SW1/4 sec. 21, T.19N., R.08E., M.3, Champaign County, Hydrologic Unit 07140201, on right upstream side of bridge on Staley Road, immediately north of Lake Point Dr., 0.35 mi. north of Windsor Road (CR 1400 North), 0.6 mi. south of Kirby Avenue, and at river mile 2.3. The USGS streamgage-station number is 05590060.

Drainage Area.--8.26 sq mi.

Gage Datum and Elevations of Reference Points.--No gage is established at this site. Staff gage 2 is located 245 ft. downstream of the bridge, elevation of brass screw = 702.5675 ft. Staff gage 1 is located 488 ft. downstream of the bridge, elevation of brass screw = 702.428 ft. All elevations are in NGVD 1929 convention.

Stage, Discharge Measurements and Computed n-Values.--Low-water measurements are made by wading at a cross section upstream of the confluence with Phinney Branch, near the RP-N2. High-stage measurements are made from the Staley Road bridge sidewalk. When possible, multiple discharge measurements were made during a rise and recession to provide data for calculating n-values over a range in stage. The computed n-values are listed in the following table. Whenever possible, the computed n-values are associated with a photo taken at the time of the measurement. The photos are arranged from low stage to high stage in order to illustrate contributing factors of n-value at a particular stage.

Date of Observation	Discharge (ft^3/s)	Average Cross Section Area (ft^2)	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Slope	Coefficient of Roughness *n*
1/26/2007	7.8	9.6	0.61	0.90	0.000724	0.049
4/11/2007	36.1	17.6	0.99	2.16	0.000911	0.027
4/11/2007	36.8	17.3	0.97	2.25	0.000911	0.026
4/11/2007	37.2	17.0	0.96	2.31	0.000935	0.025
4/11/2007	38.1	17.5	0.98	2.30	0.000911	0.026
4/11/2007	38.5	17.3	0.97	2.35	0.000935	0.025
7/11/2006	63.1	28.9	1.43	2.24	0.001598	0.041
7/11/2006	64.4	30.6	1.50	2.13	0.001516	0.043
4/6/2006	152.0	53.0	2.06	2.88	0.001535	0.035
4/6/2006	156.0	53.6	2.07	2.93	0.001405	0.034
4/6/2006	156.3	53.8	2.07	2.92	0.001462	0.034
4/6/2006	164.2	53.3	2.06	3.10	0.001535	0.032
6/26/2007	371.0	135.0	3.26	2.77	0.000958	0.039

05590060 Copper Slough at Staley Rd at Champaign, IL 04/28/06
Gabion boxes, west of Staley Rd.

05590060 Copper Slough at Staley Rd at Champaign, IL 04/28/06
Looking downstream, below Staley Road

05590060 Copper Slough at Staley Rd at Champaign, IL 04/28/06
Looking downstream

05590060 Copper Slough at Staley Rd at Champaign, IL 01/26/07
Looking downstream below Staley Road

05590060 Copper Slough at Staley Rd at Champaign, IL 04/28/06
Looking upstream

05590060 Copper Slough at Staley Rd at Champaign, IL 06/26/2007
Looking Downstream

05590600 Copper Slough at Staley Rd at Champaign, IL 06/26/2007
Looking Downstream

Description of Channel.--This channel has concrete sidewalls along the north end of the reach but reverts to a grassy embankment for the downstream portion. The bed material consists of mud, sand, gravel, and small cobbles. The low water control is the channel. Higher stages are controlled downstream of Staley Road by gabion boxes on both banks and a grassed, earthen berm above the gabions. The right-side berm is generally mowed as needed. The bed is filled with gravel, sand, and small cobbles. Banks are wire gabion boxes filled with crushed rocks stacked three tiers high.

Floods.--

Estimated n-Values Using Cowan s Approach.--